August 5, 2005

ADDENDUM No. 9

Question #1:

Paragraph 4.8, page 21. This paragraph indicates that the "use of existing radiation data shall require approval by the Radiation Specialist."☐ Since the acceptance criteria for the review is unknown, this presents a risk to our proposal. Please specify what your acceptance criteria are for reviewing existing data.

Answer #1:

The criteria for the use of existing data varies as a function of technology, test methodology, and age (when the data was taken). Manufacturers often make changes to their fabrication processes that may improve performance or yields but may adversely affect the radiation response. By not testing the flight lot, the Project's mission success probability is at risk. As a result of the aforementioned issues, the amount of conservatism (i.e., margin) applied to existing data can only be adjudicated as part of the parts selection process.

Question #2:

Paragraph 4.8, page 21. This paragraph states that "The combined effects of TID and DD shall meet the RDF requirements of the PIP." Please specify what the RDF requirements are for this proposal.

Answer #2:

The RDF is 2.

Question #3:

Paragraph 4.8.1, page 21. Same comment as #1 for use of existing radiation data in lieu of RLAT.

Answer #3:

Same answer as #1.

Question #4:

Paragraph 4.9, page 22. This paragraph indicates that all ELDRS testing should be performed at 0.005 rad(Si)/s. Raytheon has used ASTM F-1892-98 to perform all of its previous testing for ELDRS, using a dose rate of 0.10 rad(Si)/s. Can we use this data to characterize parts for the Mars TDS Program?

Answer #4:

The dose rate of 0.10 rad(si)/s is acceptable.

Question #5:

Paragraph 4.9.2, page 22. The requirements for SEU seem fairly tight at the part level. Specifically, that each part has an LET threshold of 75 MeV-cm2/mg or an upset rate of 1E-10 upsets/device/day. Can we use parts that do not meet these requirements, but do not have an impact on system performance or mission completion? Also, do you have a specification for the Galactic Cosmic Ray environment for the mission?

Answer #5:

The use of parts with an SEU threshold LET of less than 75 MeV-cm2/mg or a device upset rate > 1E-10 upsets/device/day will require a waiver. In order for the waiver to be approved, we will need an analysis from the TDS vendor that indicates that the upset rate or upset probability during EDL is acceptable (acceptability TBD but probably in the 1E-5 range) for both the Design Case Flare and the GCR environment.

The Solar proton flux is provided in the MSL ERD (Exhibit V) page 90, par. 4.16.3.1 and the GCR Heinrich flux is given on page 91, par.4.16.3.2.